Treatment for Lipid Disorders

Physician’s Treatment Guide

**Elevated LDL Cholesterol**

**LIPID DISORDER**

LDL is one of the classes of lipoproteins that transports cholesterol to tissues and organs. Lowering LDL-C is a primary focus of the NCEP-ATP III and 2013 ACC/AHA ASCVD Risk and Treatment Guidelines. Elevated LDL-C is an independent risk factor for CVD and associated with a 1.6x increased risk in CVD events.

**CONTRIBUTING FACTORS**
- Genetic predisposition
- High consumption of saturated fats
- Overweight or obesity
- Sedentary lifestyle
- Illness: Nephrotic syndrome, hypothyroidism, cystic fibrosis
- Drugs: Androgens, progestins, thiazide diuretics, cyclosporines, tacrolimus, simvastatin absorption inhibitors

**TREATMENT CONSIDERATIONS**
- Cardio-protective diet
- Restricted saturated fat
- Fat weight loss
- Statins
- Nicotinic acid
- Bile acid sequestrants

**Low HDL Cholesterol**

**LIPID DISORDER**

HDL is the major class of lipoproteins that facilitates cholesterol transport from cells, plasma cholesterol esterification, cholesterol transfer to other lipoproteins, and cholesterol transfer to the liver for excretion (reverse cholesterol transport). Low HDL-C is a secondary focus of NCEP-ATP III guidelines. Low HDL-C is independently associated with a 1.7x to 2.4x increased CVD risk.

**CONTRIBUTING FACTORS**
- Genetic predisposition
- High triglycerides
- High consumption of simple carbohydrates
- Overweight or obesity
- Sedentary lifestyle
- Insulin resistance/diabetes mellitus
- Smoking
- Illness: Liver, kidney, and thyroid disease
- Drugs: Non-selective beta blockers, androgens, progestins, isotretinoin

**TREATMENT CONSIDERATIONS**
- Cardio-protective diet
- Fat weight loss
- Regular aerobic exercise
- Smoking cessation
- Correct insulin resistance
- Control diabetes mellitus
- Nicotinic acid
- Fibates
- Thiazolidinediones
- Omega-3 fish oil
- Some statins
Elevated Triglycerides

LIPID DISORDER
A triglyceride is an ester derived from glycerol and three fatty acids. The major lipid in chylomicrons, VLDLs, and IDLs. Hypertriglyceridemia may increase CVD risk. Elevated triglycerides are a secondary focus of NCEP-ATP III guidelines. Elevated triglycerides are a component of the metabolic syndrome and are associated with a 1.7x to 4.0x increased CVD risk.

CONTRIBUTING FACTORS
- Genetic predisposition
- High consumption of simple carbohydrates and saturated fats
- Overweight or obesity
- Sedentary lifestyle
- Illness: Hepatocellular carcinoma, renal failure, excess alcohol intake
- Pregnancy and lactation
- Smoking
- Drugs: Androgens, estrogens, beta blockers, thiazide diuretics, glucocorticosteroids, cyclosporines, protease inhibitors, tacrolimus, sertraline, isotretinoin, valproate

TREATMENT CONSIDERATIONS
- Regular aerobic exercise
- Fat weight loss
- Avoid high glycemic foods
- Low simple carbohydrate and saturated fat diet
- Avoid alcohol consumption
- Fibrates
- Nicotinic acid
- Omega-3 fish oil
- Thiazolidinediones (pioglitazone but NOT rosiglitazone)
- Some statins
- Treat levels >500 mg/dL to help prevent acute pancreatitis

Pattern B Phenotype/Decreased LDL Peak Size

LIPOPROTEIN SUBFRACTION DISORDERS
Pattern B is described as a predominance of Small LDL subclass particles as represented on the Ion Mobility patient result figure. Pattern B represents an atherogenic lipid profile which is associated with a 1.3x increased risk for CVD.

DECREASED LDL PEAK SIZE
Further assessment of pattern includes measurement of peak size. Average size of LDL peak subclass particles measuring less than 218 angstroms, as measured with Ion Mobility, are associated with a 1.35x increased CVD risk.

Decreased Large HDL

LIPOPROTEIN SUBFRACTION DISORDERS
Decreased levels of the Large HDL subclass are associated with a 1.8x increased CVD risk .

CONTRIBUTING FACTORS
- Genetic predisposition
- High consumption of simple carbohydrates
- Overweight or obesity
- Sedentary lifestyle
- Illness: Nephrotic syndrome, hypothyroidism, cystic fibrosis
- Drugs: Androgens, progestins, thiazide diuretics, cyclosporines, protease inhibitors, tacrolimus, sertraline, isotretinoin, valproate

TREATMENT CONSIDERATIONS
- Consider evaluation of cardio-metabolic function
- Noninvasive imaging
- Additional blood tests
- Avoid simple carbohydrate diet
- Fat weight loss
- Regular exercise
- Identify and correct insulin resistance
- Thiazolidinediones
- Control diabetes mellitus
- Nicotinic acid
- Fibrates
- Statins (minor effect)
- Omega-3 fish oil

For a more comprehensive list of medications that may affect any of the assays in this publication, please refer to Goodman and Gilman’s The Pharmacological Basis of Therapeutics or other valued source.
Elevated Triglycerides

**LIPODISORDER**
A triglyceride is an ester derived from glycerol and three fatty acids. The major lipid in chyomicrons, VLDLs, and IDLs. Hypertriglyceridemia may increase CVD risk. Elevated triglycerides are a secondary focus of NCEP-ATP III guidelines. Elevated triglycerides are a component of the metabolic syndrome and are associated with a 1.7x to 4x increased CVD risk.

**CONTRIBUTING FACTORS**
- Genetic predisposition
- High consumption of simple carbohydrates and saturated fats
- Overweight or obesity
- Sedentary lifestyle
- Insulin resistance/diabetes mellitus/metabolic syndrome
- Illness: Hypothyroidism, renal failure, excess alcohol intake
- Pregnancy and lactation
- Smoking
- Drugs: Androgens, estrogens, beta blockers, thiazide diuretics, glucocorticosteroids, cyclosporines, protease inhibitors, tacrolimus, seoratrin, isorotrin, valproate

**TREATMENT CONSIDERATIONS**
- Regular aerobic exercise
- Fat weight loss
- Avoid high glycermic foods
- Low simple carbohydrate and saturated fat diet
- Avoid alcohol consumption
- Fibrates
- Nicotinic acid
- Omega-3 fish oil
- Thiazolidinediones (pioglitazone but NOT rosiglitazone)
- Some statins
- Treat levels >500 mg/dL to help prevent acute pancreatitis

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Elevated Small and/or Medium Particle Number

**LIPOPROTEIN LDL PARTICLE NUMBER DISORDER**
Ion mobility measures the number of particles in each of the eight LDL subclasses. These eight subclasses comprise the LDL particle number. An elevated total LDL particle number is associated with a 1.4x increased CVD risk.

**CONTRIBUTING FACTORS**
- Genetic predisposition
- High consumption of saturated fats
- Overweight or obesity
- Sedentary lifestyle
- Illness: Nephrotic syndrome, hypothyroidism, cystic fibrosis
- Drugs: Androgens, progestins, thiazide diuretics, cyclosporines, tacrolimus, seoratrin, isorotrin, valproate

**TREATMENT CONSIDERATIONS**
- Cardio-protective diet
- Restricted saturated fat
- Fat weight loss
- Statins
- Nicotinic acid
- Bile acid sequestrants

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Decreased Large HDL

**LIPOPROTEIN SUBFRACTION DISORDERS**
Ion Mobility identifies five subclasses of HDL, one is identified as Large HDL. Decreased levels of the Large HDL subclass are associated with a 1.3x increased CVD risk. Large HDL particles are functionally associated with an antioxidant, paraoxanase, which may help protect the arterial wall.

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- Overweight or obesity
- Sedentary lifestyle
- Insulin resistance/diabetes mellitus
- Smoking
- Illness: Liver, kidney, and thyroid disease
- Drugs: Non-selective beta blockers, androgens, progestins

**TREATMENT CONSIDERATIONS**
- Avoid simple dietary carbohydrates
- Fat weight loss
- Regular exercise
- Smoking cessation
- Correct insulin resistance
- Control diabetes mellitus
- Nicotinic acid
- Nicotinic acid plus statin
- Some statins
- Fibrates when triglycerides are elevated
- Omega-3

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Decreased LDL Peak Size

**LIPOPROTEIN SUBFRACTION DISORDERS**
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**TREATMENT CONSIDERATIONS**
- Consider evaluation of cardio-metabolic function
- Noninvasive imaging
- Additional blood tests
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- Fat weight loss
- Regular exercise
- Identify and correct insulin resistance
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### Treatment for Lipid Disorders

**Physician’s Treatment Guide**

#### Lipid Disorder Contributing Factors

**Elevated LDL Cholesterol**
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- Overweight or obesity
- Sedentary lifestyle
- Illness: Nephrotic syndrome, hypothyroidism, cystic fibrosis
- Drugs: Androgens, progestins, thiazide diuretics, cyclosporines, tacrolimus, sertraline absorption inhibitors

**Low HDL Cholesterol**
- Genetic predisposition
- High triglycerides
- High consumption of simple carbohydrates
- Overweight or obesity
- Sedentary lifestyle
- Illness: Nephrotic syndrome, hypothyroidism, cystic fibrosis
- Drugs: Androgens, progestins, thiazide diuretics, cyclosporines, tacrolimus, sertraline absorption inhibitors

#### Treatment Considerations

**Elevated LDL Cholesterol**
- Cardio-protective diet
- Restricted saturated fat
- Fat weight loss
- Statins
- Nicotinic acid
- Bile acid sequestrants

**Low HDL Cholesterol**
- Cardio-protective diet
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- Thiazolidinediones
- Omega-3 fish oil
- Some statins

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**Cardio IQ™ Testing Options from Sonora Quest Laboratories**

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*The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payor being billed.